

Special Issue:

PLASMA ASTROPHYSICS AND SPACE PHYSICS

Proceedings of the VIIIth International Conference  
held in Lindau, Germany, May 4-8, 1998

Guest Editors:

JÖRG BÜCHNER, SIR IAN AXFORD, ECKART MARSCH  
and VYTENIS VASYLIUNAS

Preface	vii-xi
List of Participants	xiii-xx

MAGNETIC RECONNECTION

E.N. PARKER / Magnetic Discontinuities from Field Topology	1-7
H.E. PETSCHKEK / Thoughts on Reconnection	9-16
A. OTTO / Three-Dimensional Magnetic Reconnection in Astrophysical Plasmas - MHD Approach	17-24
J. BÜCHNER / Three-Dimensional Magnetic Reconnection in Astrophysical Plasmas - Kinetic Approach	25-42

CORONAL HEATING AND SOLAR WIND ACCELERATION

K. WILHELM / The Darkest Regions of Solar Polar Coronal Holes Observed by Sumer on Soho	43-52
K. STUCKI, S.K. SOLANKI, I. RÜEDI, J.O. STENFLO, A. BRKOVIĆ, U. SCHÜHLE, K. WILHELM and M.C.E. HUBER / Coronal Holes versus Normal Quiet Sun Observed with Sumer	53-61
E. MARSCH / Cyclotron Heating of the Solar Corona	63-76
E. PRIEST / Heating the Solar Corona by Magnetic Reconnection	77-100
A.A. GALEEV and A.M. SADOVSKI / Solar Wind Acceleration by the Dissipation of Alfvén Waves	101-112
R. JAIN and G.E. VEKSTEIN / Plasma Heating by Forced Magnetic Reconnection	113-128
K. SHIBATA / Evidence of Magnetic Reconnection in Solar Flares and a Unified Model of Flares	129-144
Y. UCHIDA, S. HIROSE, S. MORITA, M. TORII, T. TANAKA, T. YABIKU, T. MIYAGOSHI, S. UEMURA and T. YAMAGUCHI / Observations of Flares and Active Regions from YOHKOH, and magnetodynamic models explaining them	145-169

L.A. PUSTIL'NIK / Solar Flare Phenomena as Phase Transition Caused by Frustration of Current Percolation	171-182
--	---------

#### JETS AND WINDS

E. TRUSSONI, C. SAUTY, K. TSINGANOS and N. VLAHAKIS / Steady MHD Solutions for Collimated Winds	183-194
Y. UCHIDA, M. NAKAMURA, S. HIROSE and S. UEMURA / Magnetodynamic Formation of Jets in Accretion Process of Magnetized Mass onto the Central Gravitator - Cases of Forming Stars and Active Galactic Nuclei	195-212

#### MULTI-ION AND DUSTY PLASMAS

H. KIMURA, I. MANN and A. WEHRY / Interstellar dust in the Solar System	213-218
S.I. POPEL and V.N. TSYTOVICH / Shocks in Space Dusty plasmas	219-226
K. JOCKERS, T. BONEV and T. CREDNER / Observations of Ions in Comets: A Contribution towards Understanding the Comet-Solar Wind Interaction	227-234
P.K. SHUKLA / Waves and Instabilities in Magnetized Dusty Plasmas	235-245
H. KRÜGER, E. GRÜN, A. GRAPS, S. LAMMERS / Observations of Electromagnetically Coupled Dust in the Jovian Magnetosphere	247-256
M. HORÁNYI / Dust Plasma Interactions at Jupiter	257-271
E. DUBININ and K. SAUER / The Martian Magnetosphere - a Laboratory for Bi-Ion Plasma Investigations	273-288

#### NONLINEAR DYNAMICS, DYNAMO, PLASMA TURBULENCE

K. SCHINDLER / Formation of Thin Current Sheets and Other Recent Developments in Magnetospheric Activity	289-302
T. CHANG / Self-Organized Criticality, Multi-Fractal Spectra, and Intermittent Merging of Coherent Structures in the Magnetotail	303-316
A.V. MILOVANOV and L.M. ZELENYI / Fracton Excitations as a Driving Mechanisms for The Self-Organized Dynamical Structuring in The Solar Wind	317-345
H. WIECHEN, G.T. BIRK and H. LESCH / Self-Generation of Magnetic Fields in Weakly Ionized Astrophysical Plasmas	347-356
S.A. COLGATE and H. LI / Dynamo Dominated Accretion and Energy Flow: The Mechanism of Active Galactic Nuclei	357-380
J.I. SAKAI, Y. KAZIMURA and S.V. BULANOV / Generation of Magnetic Field and Fast Particles during Collision of Electron-Positron Plasma Clouds	381-390

#### NONTHERMAL RADIATION

D.B. MELROSE / Coherent Emission in Astrophysics: A Critique	391-400
D.B. MELROSE / Radiation from Instabilities in Space Plasmas	401-410

M. LYUTIKOV / Coherent Emission Mechanisms in Radio Pulsars	411-421
---	---------

## COSMIC RAY AND PARTICLE ACCELERATION

P.L. BIERMANN / The Origin of Highest Energy Cosmic Rays and Cosmic Magnetic Fields	423-435
W.-H. IP and W.I. AXFORD / Cosmic Rays and Clusters of Galaxies	437-442
L.I. DORMAN / Cosmic Ray Nonlinear Processes in Space Plasma: Applications to the Dynamic Heliosphere	443-455
R. SCHLICKEISER and R. VAINIO / Recent Developments in Quasilinear Cosmic Ray Particle Acceleration Theories	457-469
K. MANNHEIM / Constraints on Particle Acceleration from the Extragalactic X-Ray Background	471-479
N. SHIMADA, T. TERASAWA, M. HOSHINO, T. NAITO, H. MATSUI, T. KOI, K. MAEZAWA and THE GEOTAIL/LEP/MGF/HEP TEAMS / Diffusive Shock Acceleration of Electrons at an Interplanetary Shock Observed on 21 Feb. 1994	481-488
G. MANN, H.-T. CLASSEN, U. MOTSCHMANN, H. KUNOW and W.DRÖGE / High Energetic Electrons Accelerated by a Coronal Shock Wave	489-496
M.A. LEE / The Injection, Acceleration, and Dynamical Influence of Interstellar Pickup Ions at the Solar Wind Termination Shock	497-508
S.V. CHALOV and H.J. FAHR / Interplanetary Pick-Up Ion Acceleration	509-525
M. SCHOLER and H. KUCHAREK / Dissipation, Ion Injection, and Acceleration in Collisionless Quasi-Parallel Shocks	527-543
S.M.P. McKENNA-LAWLOR, E. KIRSCH and P. DALY / Particle Acceleration at Comet Related Shock Surfaces	545-566
List of Forthcoming Papers	567
The Kluwer Latex Style File	569-570